I. AMENDMENTS

AMENDMENTS TO THE CLAIMS

Please enter the amendment to claim 15, as shown below.

1. (Previously presented) A method for synthesizing isopentenyl pyrophosphate (IPP) via a mevalonate pathway in a host microorganism, wherein the method comprises:

culturing a transformed host microorganism in a suitable medium, the transformed host microorganism comprising one or more nucleic acids heterologous to the host microorganism, wherein the one or more nucleic acids comprises nucleotide sequences encoding two or more enzymes in the mevalonate pathway, and wherein the host microorganism is a prokaryote that does not normally synthesize IPP through the mevalonate pathway; wherein the mevalonate pathway comprises:

(a) condensing two molecules of acetyl-CoA to acetoacetyl-CoA;

(b) condensing acetoacetyl-CoA with acetyl-CoA to form HMG-CoA;

(c) converting HMG-CoA to mevalonate;

(d) phosphorylating mevalonate to mevalonate 5-phosphate;

(e) converting mevalonate 5-phosphate to mevalonate 5-pyrophosphate; and

(f) converting mevalonate 5-pyrophosphate to isopentenyl pyrophosphate,

said culturing providing for production of the enzymes,

wherein said production of said two or more enzymes results in production of IPP.

2. (Previously presented) The method of claim 1, wherein the one or more heterologous nucleic acids is integrated into the chromosome of the host microorganism.

3. (Previously presented) The method of claim 1, wherein the one or more heterologous nucleic acids is contained in at least one extrachromosomal expression vector.

4. (Previously presented) The method of claim 3, wherein the one or more heterologous nucleic acids is present in a single expression vector.

5. (Previously presented) The method of claim 4, wherein the single expression vector comprises the nucleotide sequence set forth in SEQ ID NO 7.

6. (Previously presented) The method of claim 3, wherein each of the one or more heterologous nucleic acids is contained within a separate expression vector.

7. (Previously presented) The method of claim 3, wherein at least two of the one or more heterologous nucleic acids are contained in a single expression vector.

8. (Previously presented) The method of claim 3, wherein the one or more heterologous nucleic acids is contained in two expression vectors.

9. (Previously presented) The method of claim 8, wherein the first expression vector comprises the nucleotide sequence set forth in SEQ ID NO 8, and the second expression vector comprises the nucleotide sequence set forth in SEQ ID NO 9.

10. (Previously presented) A method for synthesizing isopentenyl pyrophosphate (IPP) via a mevalonate pathway in a host microorganism, the method comprising:

culturing a transformed host microorganism in a suitable medium, the transformed host microorganism comprising one or more nucleic acids heterologous to the host microorganism, wherein the host microorganism is a prokaryote that does not normally synthesize IPP through the mevalonate pathway, wherein the one or more nucleic acids comprises nucleotide sequences encoding two or more enzymes selected from:

a) an enzyme capable of condensing two molecules of acetyl-CoA to acetoacetyl-CoA, wherein said enzyme is from *Ralstonia*, *Saccharomyces*, or *Escherichia coli*;

b) an enzyme capable of condensing acetoacetyl-CoA with acetyl-CoA to form HMG-CoA, wherein said enzyme is from *Blattella or Saccharomyes*;

c) an enzyme capable of converting HMG-CoA to mevalonate, wherein said enzyme is from *Sulfolobus*, *Haloferax*, or *Saccharomyces*;

d) a *Saccharomyces* enzyme capable of phosphorylating mevalonate to mevalonate 5-phosphate ;

e) a *Saccharomyces* enzyme capable of converting mevalonate 5-phosphate to mevalonate 5-pyrophosphate; and

f) a *Saccharomyces* enzyme capable of converting mevalonate 5-pyrophosphate to isopentenyl pyrophosphate,

said culturing providing for production of the enzymes, wherein said production of said two or more enzymes results in production of IPP.

11. (Previously presented) The method of claim 10, wherein the one or more heterologous nucleic acids comprises:

a) the nucleotide sequence of SEQ ID NO 1;

b) the nucleotide sequence of SEQ ID NO 2;

c) the nucleotide sequence of SEQ ID NO 3;

d) the nucleotide sequence of SEQ ID NO 4;

e) the nucleotide sequence of SEQ ID NO 5; and

f) the nucleotide sequence of SEQ ID NO 6.

12. (Previously presented) The method of claim 1, further comprising recovering the isopentenyl pyrophosphate from the transformed host microorganism.

13. (Previously presented) The method of claim 1, wherein the method further comprises reacting isopentenyl pyrophosphate with dimethylallyl pyrophosphate or a polyprenyl pyrophosphate in the presence of at least one enzyme to provide a polyprenyl pyrophosphate isoprenoid precursor.

14. (Previously presented) The method of claim 13, wherein the one or more heterologous nucleic acids further comprises:

g) a DNA fragment coding for an enzyme capable of converting isopentenyl pyrophosphate to dimethylallyl pyrophosphate.

15. (Currently amended) The method of claim ~~13, further comprising reacting the polyprenyl pyrophosphate isoprenoid precursor in the presence of an isoprenoid-forming enzyme to form~~ 1, wherein the isopentenyl pyrophosphate is further modified to provide an isoprenoid selected from the group consisting of a monoterpene, sesquiterpene, diterpene, sesterterpene, triterpene, tetraterpene, and a steroid.

16. (Original) The method of claim 15, wherein the isoprenoid is a monoterpene.

17. (Original) The method of claim 16, wherein the monoterpene is selected from the group consisting of limonene, citranellol, and geraniol.

18. (Original) The method of claim 15, wherein the isoprenoid is a sesquiterpene.

19. (Original) The method of claim 18, wherein the sesquiterpene is selected from the group consisting of periplanone B, artemisinin, ginkgolide B, forskolin, and farnesol.

20. (Previously presented) The method of claim 15, wherein the isoprenoid is a diterpene.

21. (Original) The method of claim 20, wherein the diterpene is selected from the group consisting of casbene and paclitaxel.

22. (Canceled)

23. (Previously presented) The method of claim 1, wherein the prokaryote is *Escherichia coli.*

24.-60. (Canceled)